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ABSTRACT

This annotated bibliography is composed of 70 citations relevant for Program, Planning, Budgeting Systems (PPBS) and ranging in date from 1962 to 1969 but emphasizing the 1965 to 1968 period. Listings are arranged alphabetically according to author under the general divisions: Overview of PPBS, Systems and Administrative Theory, The Planning Process, Program Budgeting and Management Control, Identification and Analysis of Investment Alternatives, Education and Economics, Data and Statistical Analysis, and Limitations of PPBS. An author index is included. Volumes I, An Instructional Outline and II, A Case Problem are available as ED 032 417 and ED 032 418 respectively. (CH)

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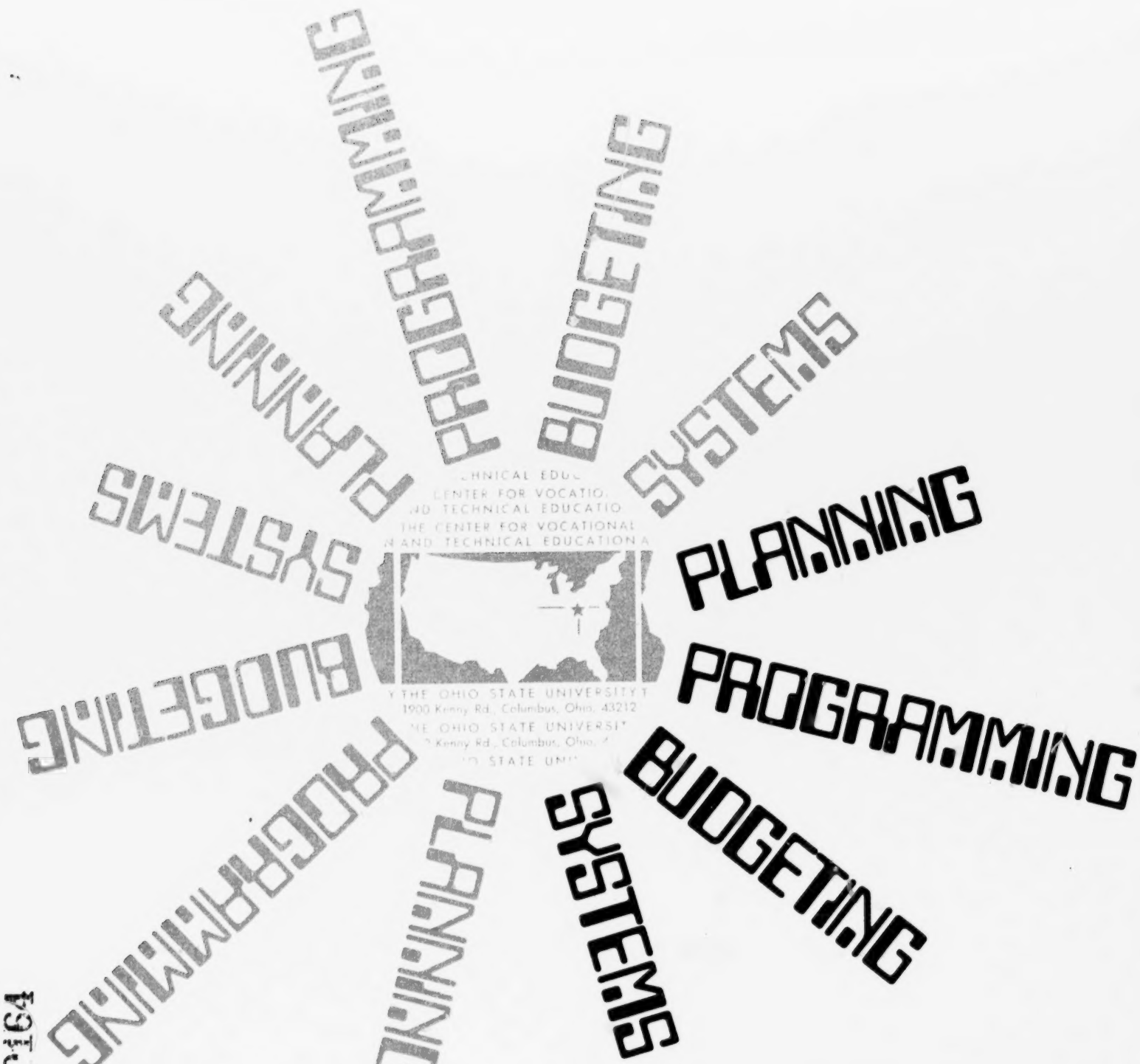

FOR EDUCATORS
VOLUME 3
AN ANNOTATED BIBLIOGRAPHY

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The major objectives of The Center follow:

1. To provide continuing reappraisal of the role and function of vocational and technical education in our democratic society;

2 To stimulate and strengthen state, regional, and national programs of applied research and development directed toward the solution of pressing problems in vocational and technical education;

3. To encourage the development of research to improve vocational and technical education in institutions of higher education and other appropriate settings;

4. To conduct research studies directed toward the development of new knowledge and new applications of existing knowledge in vocational and technical education;

5. To upgrade vocational education leadership (state supervisors, teacher educators, research specialists, and others) through an advanced study and inservice education program;

6. To provide a national information retrieval, storage, and dissemination system for vocational and technical education linked with the Educational Resources Information Center located in the U. S. Office of Education.

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BIBLIOGRAPHY SERIES NO. 3
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FINAL REPORT
ON A PROJECT CONDUCTED UNDER
PROJECT NO. 7-0158
GRANT NO. OEG-3-7-000158-2037

PROGRAM, PLANNING, BUDGETING SYSTEMS FOR EDUCATORS. VOLUME III: AN ANNOTATED BIBLIOGRAPHY

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PREFACE

One of the major commitments of The Center for Research and Leadership Development in Vocational and Technical Education is state leadership development and training. In 1967, The Center sponsored a national conference on state leadership which is reported in *The Emerging Role of State Education Departments with Specific Implications for Divisions of Vocational-Technical Education*. One of several important outgrowths of this conference was the recognition of a greater need for rational systems for planning, programming and budgeting state educational needs.

The Vocational Education Amendments of 1968 further reinforce this concept and require states to submit state educational plans for five years. Such requirements necessitate long-range planning, development and program evaluation by states. In recent years, considerable emphasis has been placed on economic models for planning a variety of programs, including education. Planning-Programming-Budgeting Systems (PPBS) have received new eminence and are being implemented in a variety of settings. It appears that the concepts underlying PPBS will exert an even greater influence in decisions concerning vocational and technical education in the future.

In October of 1968, The Center sponsored a two-week institute on planning-programming-budgeting systems for state level personnel in vocational and technical education. Four volumes of leadership training materials on the applications of planning-programming-budgeting systems to vocational and technical education were prepared. Volume I constitutes the basis for a training program in PPBS. It outlines the parameters of PPBS and, more importantly, explores the interrelationships of the concepts and techniques undergirding the system. Supplementing this basic volume are three additional volumes which complete the total training package. Volume II presents a simulated case problem to which the concepts delineated in Volume I can be applied. Volume III contains annotations of selected references which aid the process of understanding and applying PPBS. Volume IV is a research bibliography containing a comprehensive listing of PPBS references.

We hope that this annotated bibliography will be of use to personnel at all levels in vocational and technical education systems. The Center is grateful to many individuals and groups who contributed to the development of these instructional materials and bibliographies. Special recognition is due Joseph H. McGivney, formerly specialist at The Center and now a member of

the faculty at Syracuse University, and William C. Nelson, research associate at The Center, for their work, development and authorship of the instructional materials and bibliographies.

Robert E. Taylor
Director
The Center for Vocational
and Technical Education

INTRODUCTION

This volume is the third in a series of training materials designed to provide educators with the concepts, techniques and insights into the processes of Planning-Programming-Budgeting-Systems (PPBS). Each of the volumes may be used alone; however, they compliment each other and are aimed at providing a complete package of instructional materials for a training institute.

Volume I: An Instructional Outline is a text outlining the concepts and methodologies of PPBS. It includes materials designed for projectuals and/or handouts.

Volume II: A Case Problem consists of an eight-step case problem and includes hypothetical data, blank forms, and procedures. The situation is a state division of vocational education.

Volume IV: A Research Bibliography contains over 700 references to recent literature on PPBS or related to PPBS. It is organized in the same manner as this annotated bibliography.

Since the arrival of PPBS to government agencies, the quantity of literature on PPBS has increased at a phenomenal rate. The purpose of this bibliography is to assist students and practitioners of PPBS in identifying basic references in specific areas of PPBS. Titles which are available through the Educational Resources Information Center (ERIC) have an ERIC document (ED) number following the bibliographic citation. The issue of *Research in Education* (RIE) or the issue of *Office of Education Reports, 1956-65*, which contain the ERIC resume is given along with the microfiche (MF) and hard copy (HC) prices. (In some instances a future issue of RIE is cited and the ED number, MF, and HC can be obtained from RIE when it is published).

Microfiche or hard copy is available from the ERIC Document Reproduction Service (EDRS). Orders must include payment for items totaling less than $5, a handling charge of 50 cents, and sales tax for states with sales tax laws. Send order to EDRS, National Cash Register Company, 4936 Fairmont Avenue, Bethesda, Maryland 20014.

EDRS prices cited in this bibliography reflect the prices in effect at the time of publication. Retrospective use of this bibliography require attention to the most recent price schedules which are available in a current issue of RIE.

It is hoped that the use of this bibliography can significantly reduce the time spent in literature searches by students and can provide practitioners with material which may not yet have attracted their attention.

Joseph H. McGivney

William C. Nelson

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Part 1

OVERVIEW OF PPBS

CONCEPTS, HISTORY AND RATIONALE

Chambers, George A., "The Concepts and Problems of Planning-Programming-Budgeting System," *Journal on State School System*, Volume 1, No. 4, Winter, 1968, pp. 223-236.

A general, non-technical introduction to PPBS which includes history, concepts and definitions. The potential benefits of PPBS to local school systems are explicated and the major problems of operationalizing PPBS are discussed. Chambers concludes by stating that Planning-Programming-Budgeting-Analysis-Evaluation System would be a more descriptive label of the actual process and concepts than PPBS.

Exton, Elaine, "Word From Washington," *The American School Board Journal*, Volume 153, No. 5 and 6, Volume 154, No. 1 and 2, November and December, 1966, January and February, 1967.

In this series of four articles in consecutive issues, PPBS is explained and its implications discussed. Arguments by educators and politicians for and against the installation of PPBS in educational settings are given. The articles are:

1. "Federal Program Budgeting Is a Step Toward Centralized Educational Planning."
2. "Here's How HEW Department Applies Planning-Programming-Budgeting Systems."
3. "Office of Education Uses Computer-Based Models to Evaluate American Education."
4. "State Legislators Urged to Install Planning-Programming-Budgeting System."

Hartley, Henry J., *Educational Planning-Programming-Budgeting, A Systems Approach*, Englewood Cliffs, New Jersey, Prentice Hall, Inc., 1968, 280 pp.

An introductory text for educators which describes PPBS, systems analysis, PERT and other management techniques in relatively nontechnical terms. Some of the specific subjects included are educational planning, systems analysis in education, program structures in local schools, recent projects in PPBS, administrative issues, and limitations of PPBS.

Also provided are examples of operating program budgets, references, flow charts, guides, and a glossary.

Hovey, Harold A., *The Planning-Programming-Budgeting Approach to Government Decision-Making*, New York, New York, Frederick A. Praeger Publishers, 1968, 264 pp.

This book is divided into three parts which emphasize the process and potential, the problems, and an evaluation of PPBS, respectively. Each chapter contains a summary and references. Also, included is a bibliographic comment which identifies useful references based on the academic background, interests, and knowledge of PPBS of the reader.

Part I, The PPB Approach, discusses the need for PPB along with chapters on goals, alternatives, cost analysis, benefit/cost analysis, and administrative control. The last chapter of this part deals completely with a hypothetical example of the advantages of PPBS.

Problems of PPB, Part II, stresses the conceptual, technical and political difficulties of implementing a PPB system in government agencies. A large number of examples taken from the federal government underscore the difference between theory and operation of PPB with respect to goals, benefit/cost calculations, and agency strategies.

In the last part, Conclusions, Dr. Hovey evaluates the advantages and disadvantages of PPBS with respect to its future usefulness to government decision-makers.

Kotz, Arnold, ed., *Occupational Education: Planning and Programming, Volumes I and II*, Menlo Park, California, Stanford Research Institute, 1967, 476 pp. ED 017 734, RIE, August 1968, MF-$1.25; HC-$14.05.

These two volumes contain papers prepared for the Airlie House Conference on Vocational Education, Spring, 1967, with

topic introductions, recommendations, and summaries by Kotz and staff. Grant Venn outlines some broad objectives and philosophy that should guide vocational education. Charles Hitch stresses the value of PPB systems to education while Garth Mangum's paper raises many significant problems and identifies issues for consideration by educators and manpower specialists. David Bushnell, Robert Morgan, Wilbur Landis, and Robert Worthington set forth alternative approaches to vocational education.

In the program budgeting and economic analysis areas, contributions are made by Bruce Davie, Thomas Fox, Robert Grosse, Einar Harding, Robert Spiegelman, and Ernst Stromsdorfer. Many of these papers focus on benefit-cost analysis of vocational education.

Thayne Robson, Sol Swerdloff, and Norman Medvin discuss the current strengths and deficiencies in manpower supply and demand projections.

Lyden, Fremont J., and Miller, Ernest G., eds., *Planning Programming Budgeting: A Systems Approach to Management*, Chicago, Illinois, Markham Publishing Company, 1967, 443 pp.

This book of readings contains 19 articles grouped under six headings. The six major topics are: 1) PPB in Perspective; 2) Budgeting and the Political Process; 3) Approaches to Planning and Program Budgeting; 4) The PPB Approach to Budgeting; 5) The Systems Base of PPB; and 6) Application and Critique of PPB.

The authors include Virginia Held, Allen Schick, Jesse Burkhead, Eva Mueller, Yehezkel Dror, Verne Lewis, Arthur Hammann, Murray Weidenbaum, Gene Fisher, Roland McKean, Arthor Maass, Werner Hirsch, Alain Enthoven, E. S. Quade, Helen Micol, Magorah Maruyama, Melvin Anshen, Steven Lazarus, and Aaron Wildavsky.

Also provided in the Appendix and the U. S. Bureau of the Budget Bulletins 66-3, Supplement to 66-3 and 68-2.

McGivney, Joseph H., "PPBS: A More Rational Approach to Decision-Making in Vocational Education," *American Vocational Journal*, Volume 44, No. 5, May, 1969, pp. 63-65

This article contains a brief description of history of PPBS in various governmental agencies and explicates the philosophy and major components of a planning-programming-budgeting-system. The major emphasis of the article is on

the implications of PPBS for vocational educators. First, the author states that the implementation of PPBS will affect not only the size and number of educational districts, but their organizational and staffing patterns as well. Second, current training programs for vocational administrators will be altered to include policy sciences curricula designed to upgrade present and prospective policy makers.

McGivney, Joseph H., and Nelson, William C., *Planning, Programming, Budgeting Systems for Educators, Volume I: An Instructional Outline*, Columbus, Ohio, The Center for Vocational and Technical Education, 1969, 282 pp. See RIE, January 1970.

This volume is designed to serve as a guide to students, teachers, and practitioners in the study of PPBS. Many of the pages can be directly converted into transparencies for instructional purposes.

There are four major parts to the outline. Part one describes the training program and suggests alternative ways of structuring and presenting the program. Part two contains nine sections explaining the basic concepts and methodologies of PPBS. Supplementary material on planning and control systems, economics, and statistics is included in part three. Part four contains evaluation instruments.

The basic educational program, part two, includes the following sections: 1) overview of PPBS; 2) Systems theory; 3) the planning process; 4) investment alternatives; 5) program budgeting; 6) analysis of alternatives; 7) programming and management control; 8) basic data for PPBS; and 9) limitations of PPBS. Each section contains introductory material which specifies the prerequisites to the section, evaluation procedures, time estimates, objectives, indicators of desired outcomes and general references to supplement the outline.

McGivney, Joseph H., and Nelson, William C., *Planning, Programming, Budgeting Systems for Educators, Volume II: A Case Problem*, Columbus, Ohio, The Center for Vocational and Technical Education, 1969, 170 pp. See RIE, January 1970.

This volume represents an eight-step application of the PPBS philosophy to a hypothetical state division of vocational education. It is divided into three major sections. Section one, instructions, contains a guide for an instruction of a training program and a general description of the problem. Section two contains the eight-step problem and section three, appendices, include a state plan, a

traditional budget, an evaluation checklist, and a benefit/cost exercise.

The steps of the problem are: 1) analysis of a traditional budget; 2) manpower needs; 3) program structure; 4) achievement of objectives; 5) estimation of costs; 6) estimation of benefits; 7) the program budget; and 8) an evaluation of PPBS. Each step includes the necessary data, materials, blank forms, specification of procedures and references. The steps of the case problem are sequenced in the same order as the topics in *Volume I: An Instructional Outline*.

Nelson, William C., *Planning, Programming, Budgeting Systems for Educators; Volume IV: A Research Bibliography*, Columbus, Ohio, The Center for Vocational and Technical Education, 1969.

This volume contains over 700 references classified by topic and listed alphabetically within each classification. The topic headings are similar to those in volumes one, two, and three. They are: 1) overview of PPBS; 2) systems theory; 3) framework for planning and control systems; 4) the planning process; 5) program budgeting; 6) programming and management control; 7) investment alternatives; 8) analysis of alternatives; 9) education and the economic systems; 10) basic data for PPBS; 11) statistical analysis; 12) limitations of PPBS; and 13) bibliographies. An author index is included in the volume.

Novick, David, ed., *Program Budgeting: Program Analysis and the Federal Budget*, Cambridge, Massachusetts, Harvard University Press, 1965, 382 pp.

This pioneering collection of articles and reports on PPBS includes an introduction and 12 essays by 11 authors from the Rand Corporation. The book is divided into three sections: 1) Government Decision-Making and the Program Budget; 2) Actual and Potential Applications of the Program Budget Idea; and 3) Implementation and Operation.

The origin and history of program budgeting is discussed in the introduction. The three articles in Part I complete the reader's introduction to PPBS by explaining the role of the budget in decision-making the concepts of program budgeting and the role of cost-utility analysis.

Among the six applications is an essay by Werner Z. Hirsch, "Education in the Program Budget." He describes the

1965 Federal education budget, its limitations and proposes a program budget to facilitate the development of answers to policy questions.

The three articles in the last section are directed at the actual and potential problems of operationalizing PPBS.

"Planning-Programming-Budgeting System: A Symposium," *Public Administration Review*, Volume XXVI, No. 4, December, 1966, 75 pp.

This volume contains articles dealing with the history development, concepts and problems of PPBS. All the articles are focused at the federal government activities, but the authors do not hold identical views of PPBS. The authors and articles are:

1. Allen Schick, "The Road to PPBS: The Stages of Budget Reform."

2. Werner Z. Hirsch, "Toward Federal Program Budgeting."

3. Samuel M. Greenhouse, "The Planning-Programming-Budgeting System: Rationale, Language, and Idea-Relationships."

4. Francis E. McGilvery, "A Mangement Accounts Structure."

5. Robert L. Banks and Arnold Kotz, "The Program Budget and the Interest Rate for Public Investment."

6. Aaron Wildavsky, "The Political Economy of Efficiency: Cost-Benefit Analysis, Systems Analysis, and Program Budgeting."

State-Local Finances Project, *Planning-Programming-Budgeting for City, State, County Objectives*, Washington, D. C., The George Washington University, 1967, 1968, 1969.

This project is designed to assist in the adoption of PPBS by five states, five counties and five cities. To date, the output of this project has been two introductory publications, a series of 11 PPB Notes, Reports, and a set of teaching cases. They include the following:

1. "Program Planning for State, County, City," by Harry P. Hatry and John F. Cotton.

2. "What is PPB?"

3. Note 1: "Is an Integrated Planning-Programming-Budgeting System Useful for Our Jurisdiction?"

4. Note 2: "Administrative Framework for Establishing Planning-Programming-Budgeting Systems in States, Cities and Counties."

5. Note 3: "Development of Initial Instructions for Establishing Planning-Programming-Budgeting Systems in States, Cities and Counties."

6. Note 4: "Staffing and Training for a PPB System in State and Local Governments."

7. Note 5: "Developing an Objective Oriented Governmental Program Objective."

8. Note 6: "The Role and Nature of Cost Analysis in a PPB System."

9. Note 7: "Output Measures for a Multi-year Program and Financial Plan."

10. Note 8: "The Multi-year Program and Financial Plan."

11. Note 9:

12. Note 10:

13. Note 11:

14. "PPB Pilot Project Reports from Participating States, Counties and Cities."

15. "Teaching Cases in Program Planning for State, City, County Objectives."

Terrey, John N., *Program Budgeting and Other Newer Management Tools in Higher Education: A Description and Annotated Bibliography*, Occasional Paper Number 6, Seattle, Washington, University of Washington, Center for the Development of Community College Education, 1968, 57 pp.

A brief description is provided of four management techniques: 1) Planning-Programming-Budgeting Systems; 2) Systems Analysis; 3) Critical Path Method and Program Evaluation and Review Techniques; and 4) Delphi Technique.

The annotated bibliography is classified by bibliographies, books, reports, periodicals, and government publications. In addition, each item is coded according to level of difficulty and the general focus of the entry.

U. S. Subcommittee on National Security and International Operations, *Planning-Programming-Budgeting*, Washington, D. C., U. S. Government Printing Office, 1967, 1968.

A series of eight publications have originated from the Subcommittee's examination of PPBS.

1. "Initial Memorandum" Introduces the history and concepts of PPBS and discusses some of its implications for the government.

2. "Official Documents" Includes the President's references to PPBS from August 25, 1965 to March 17, 1967 and the Bureau of the Budget Bulletin No. 68-2.

3. "Selected Comment" A series of papers on PPBS by: Alain C. Enthoven, Charles J. Hitch, Klaus Knorr, Frederick C. Mosher, David Novick, H. G. Rickover, Harry S. Rowen and Aaron Wildavsky.

4. "Hearings, Parts 1, 2, and 3" Consist of the testimony of Charles L. Schultze, Director of the Budget, Alain C. Enthoven, Assistant Secretary of Defense, and Elmer B. Staats, Comptroller General of the United States.

5. "Uses and Abuses of Analysis" A paper by James R. Schlesinger cautioning against the unconditional acceptance of the conclusions of systems analysis.

6. "Budget Bureau Guidelines of 1968" Contains a copy of the Bureau of Budget Bulletin No. 68-9, a set of guidelines which includes the purpose and elements of PPBS, an annual cycle for PPBS and special emphasis on the Program and Financial Plan (PFP).

SYSTEMS AND ADMINISTRATIVE THEORY

Part 2

SYSTEMS, MODELS, ORGANIZATIONAL THEORY AND PUBLIC ADMINISTRATION

Anthony, Robert N., *Planning and Control Systems: A Framework for Analysis*, Boston, Massachusetts, Harvard University Press, 1965, 180 pp.

This book presents a conceptual framework for decision-making. The internally oriented processes are strategic planning (long run objectives and activities), management control (intermediate obtaining and using resources to attain objectives), and operations control (short run process of assuring that specific tasks are carried out effectively and efficiently). The externally oriented process is financial accounting (process of reporting information to the outside world). The fifth topic discussed is information handling (process of collecting, manipulating, and transmitting information for all uses).

The three appendices include notes on terminology and definitions, relationships between military and business planning and a discussion of valid generalizations. Footnotes and an index are included.

Blau, Peter M., and Scott, W. Richards, *Formal Organizations: A Comparative Approach*, San Francisco, California, Chandler Publishing Company, 1962, 312 pp.

This book presents a sociological analysis of some of the main facets of organizational life. It examines the nature and types of formal organizations, the connections between them and the larger social context of which they are a part, and various aspects of their internal structure, such as peer group and hierarchical relations in organizations, processes of communication, management, and impersonal mechanisms of control. The investigation of the various topics involves the discussion of many studies of organizations and numerous related studies from the literature. The aim of the book is to discover and examine those theoretical principles that can explain the structure and dynamics of organizations.

Corrigan, Robert E., and Kaufman, Roger A., *The Steps and Tools of Systems Analysis As Applied To Education*, 48 pp.

Corrigan, Robert E.; Corrigan, Betty O.; and Kaufman, Roger A., *The Steps and Tools of the System Synthesis Process in Education*, Burlingame, California, Operation PEP: A State-Wide Project to Prepare Educational Planners for California, 1967, 46 pp. ED 020-584, RIE, December 1968, MF-$0.25; HC-$1.55.

These are two of the large number of instructional documents developed by the Operation PEP staff. Both of these publications were written in an open outline style with diagrams and illustrations which are very suitable for use as visual aids.

The basic systems approach outlined in these documents consists of five steps: 1) Identify the Problem; 2) Analyze the problem and set goals; 3) Determine solution strategy; 4) Implement solution strategy; and 5) Determine strategy effectiveness. The systems analysis volume describes the first two steps in detail by breaking the procedure in a series of substeps. The systems synthesis document explicates the last three steps in a similar manner.

Gross, Bertram M., *The Managing the Organizations: The Administrative Struggle*, Volumes I and II, New York, New York, The Free Press of Glencoe, 1964, 971 pp.

This monumental two-volume book strives to achieve an action-theory marriage. It deals with the major questions asked by both administrators and scholars concerning the governance of organizations. It stresses the primacy of administrative action as both a source of theory and a test of theory's utility, but supplements this with contributions of political scientists, economists, psychologists, sociologists, anthropologists, cyberneticists and systems theorists.

Part One describes the history of the administrative revolution through major parts of the world. Theory and the development of administrative thought is the central theme of Part Two. The third part of Volume One maps out the areas of consensus in administrative thought and action. Part Four deals with the actors in the administrative drama. It explores the interests and motivations of people, separate from any administrative roles and within their organizational environments.

Volume Two contains two major topics. Part Five deals with the dimensions of organizational performance such as

the output of goods and services, satisfaction of interests, profitability, etc. Part Six is essentially a summary of the book, but also attempts to point out some of the potentialities for human progress within an administered society and outlines the possibility that multidimensional administrative theory may progress from an emerging to a mature science.

Kepner, Charles H., and Tregoe, Benjamin B., *The Rational Manager: A Systematic Approach to Problem Solving and Decision Making*, New York, New York, McGraw-Hill Company, 1965, 275 pp.

This is a summary of the problem solving method used in training courses for business managers. A brief annotated bibliography on management and problem solving procedures is included.

The nonquantitative procedure is based on the following seven concepts: 1) establishment of objectives; 2) ranking objectives as to importance; 3) development of alternatives; 4) consequence of alternatives to objectives; 5) choosing of best alternative to meet the objectives; 6) exploration of possible adverse consequences of choice; and 7) control for adverse consequences and implement the chosen plan.

Pfeiffer, John, *New Look at Education, System Analysis in Our Schools and Colleges*, Poughkeepsie, New York, The Odyssey Press, 1968, 162 pp.

In this introduction and review of systems analysis techniques, Pfeiffer briefly discusses conflict and management games, education and manpower planning, the Delphi technique, program evaluation and review techniques (PERT), computer information systems and simulations, and planning-programming-budgeting systems (PPBS). A short history is presented along with examples from education of the various systems analysis techniques. There is no bibliography or formal references in the book.

Part 3

THE PLANNING PROCESS

NEEDS, MANPOWER PROJECTIONS AND STATE ROLES

Culbertson, Jack, "State Planning for Education," *Planning and Effecting Needed Change in Education*, ed., Edgar L. Morphet, and Charles O. Ryan, New York, New York, Citation Press, 1967, pp. 266-290.

The major factors influencing the trend toward planning in education identified by the author are: 1) the increasing value being placed upon quality education and the impact upon citizens and their leaders of the increasingly large investments to achieve quality; 2) the trend toward the use of more systematic planning in state and federal government generally; 3) the large planning capacity of the business community and its growing involvement in education; and 4) the increasingly wide array of tested planning techniques which are now available for use. Three planning procedures, operations research, PPBS, and manpower requirements planning, are discussed in detail with respect to techniques, advantages and limitations.

Implications for organization and functions of state agencies, staffing requirements, and political behavior are made by the author. A supplementary statement by J. R. Rackley and D. M. Carroll emphasizes establishment of goals, assessment of product and process, and the emerging functions or components of the state education agency.

Medvin, Norman, "Occupational Job Requirements: A Short-Cut Approach to Long-Range Forecasting," *Employment Service Review*, January-February, 1967, pp. 1-14.

The author argues strongly against two ideas held by manpower forecasting technicians. The first one is the relative importance of new and emerging occupations to the total job market. He states that most job vacancies occur in existing occupations and the emerging skills are usually developed by individual companies because of the small numbers and specificity of the skill. The second "myth" men-

tioned by the author concerns the importance of preciseness in forecasts. He argues that only the direction of employment change is usually necessary.

Medvin states the basic requirements of a manpower forecasting technique are: 1) it must be simple, quick and inexpensive; 2) it must yield job openings, not just the total number of jobs; and 3) it must be based on local data. The elements of his new technique to meet these requirements are unfilled job openings of the Employment Service, the *Occupational Outlook Handbook*, and the *Dictionary of Occupational Titles*. The first step is to determine the number of job openings which have been unfilled for 30 days or more by occupation and multiplying it by a factor representing the inverse of the rate of Employment Service openings to the total job vacancies. Second, one should make an assessment of the long-range opportunities in those job categories by means of the *Occupational Outlook Handbook* or other long-range projections. The third phase is to use the *Dictionary of Occupational Titles* to cluster occupations and to plan vocational programs.

Parnes, Herbert S., *Forecasting Educational Needs for Economic and Social Development*, Paris, France, Organization for Economic Co-operation and Development, 1962, 113 pp.

This report is based on the Mediterranean Regional Project (M.R.P.) which was initiated by agreements between the O.E.C.D. and the governments of six Southern European countries. M.R.P. represents an attempt by research groups to prepare an assessment of national educational needs from 1960 to 1975 and to arrive at detailed plans, including financial estimates, for meeting these needs.

Parnes explores some of the conceptual and methodological problems involved in making an assessment of educational needs and suggests alternative approaches that appear to be useful and feasible. The emphasis is on methods of preparing estimates of the required outputs of the various components of the educational system and converting these into estimates of future enrollments. The problems involved in estimating the costs of a prescribed programme of educational expansion are also dealt with briefly. The basic procedure outlined in this book consists of the following steps: 1) determining a desirable rate of economic growth; 2) developing an industrial-occupational matrix; 3) projecting labor forces supplies and needs; 4) projecting needed outputs and enrollments of the educational system; 5) assessing cultural needs; and 6) developing a detailed educational plan with cost estimates.

Rice, Dick C., and Toth, Powell E., ed., *The Emerging Role of State Education Departments With Specific Implications for Divisions of Vocational-Technical Education*, Columbus, Ohio, The Center for Vocational and Technical Education, 1967, 395 pp. ED 016 870, RIE, July 1968, MF-$1.50; HC-$20.35.

This report contains nine background papers on major forces factors relevant to state department operations and three papers synthesizing the various viewpoints and drawing major implications for the emerging role of state departments and vocational education divisions. The final chapter summarizes the major conference inputs.

Specific problems of the changing character of general population, student population, occupational structure, and of obtaining educational opportunity for disadvantaged groups are discussed by P. M. Hauser, E. P. McLoone, L. A. Lecht, and R. D. Hess. The functions and interrelationships of education, state departments, vocational divisions, and the federal government are explicated by L. Iannacconi, N. A. Masters, F. A. J. Ianni, E. B. Nyquist, and B. Shoemaker. The emerging roles and possible strategies for state departments and vocational divisions are outlined by R. F. Campbell, G. B. James and J. A. Culbertson. The specific implications are summarized by D. C. Rice. A selected bibliography is also included in the report.

Stone, Richard, "A Model of the Educational System," *Minerva*, III, 2, Winter, 1965, pp. 172-186, and "Input-Output and Demographic Accounting: A Tool for Educational Planning," *Minerva*, IV, 3, Spring, 1966, pp. 365-380.

In the first article, Stone sets forth a model of the educational system which brought together the human inputs into the system, the flows of students through its various branches, and the economic inputs, the costs of the teachers, buildings and equipment needed to carry out the functions of these branches.

In the second article, he discusses economic input-output analysis and describes an accounting structure leading to a model which allows for time-lags in production given the assumption of fixed input coefficients. A formally identical structure for demographic flows is established and the appropriate model is obtained by fixing the output coefficients rather than the input coefficients. The categories in the demographic matrix are indicated with particular reference to educational categories.

PROGRAM BUDGETING AND MANAGEMENT CONTROL

Part 4

Bloom, Benjamin S.; Krathwohl, David R.; and Masia, Bertram B., *Taxonomy of Educational Objectives, Handbook I: Cognitive Domain, Handbook II: Affective Domain*, New York, New York, David McKay Company, Inc., 1956 and 1964, pp. 184, 196.

These taxonomies are an attempt to clarify and tighten the language of educational objectives, to provide a convenient system for describing and ordering test items and evaluation instruments, and to provide a basis for comparing educational programs.

A six stage classification system is formulated in *Handbook I: Cognitive Domain*. The cognitive continuum begins with the students' recall and recognition of "knowledge" (1.0), extends through his "comprehension" (2.0) of knowledge and his skill in "application" (3.0), "analysis" (4.0), "synthesis" (5.0) and "evaluation" (6.0). The affective continuum begins with the students "receiving" (1.0) and extends through his "responding" (2.0), "valuing" (3.0), "organization" (4.0), and "characterization" (5.0).

Burkhead, Jesse, *State and Local Taxes for Public Education*, Syracuse, New York, Syracuse University Press, 1963, 110 pp.

This monograph is a survey of the adequacy of state and local taxes for the support of public elementary and secondary education. The author briefly discusses the whole of the fiscal operations of state and local governments, and their interrelations with each other and with national government finance in order to place school finance in proper perspective.

Major attention is centered on the property tax system. Specific aspects of the property tax discussed by Burkhead are the incidence, allocation, elasticity, and possibilities for reform of the tax. Two other general sources of state

and local support for public education were examined in less detail. The first of these is general state revenue, the sources of support for grants-in-aid to local school districts. The second consists of local nonproperty taxes which have offered some incidental revenue support to public education in recent years.

Cook, Desmond L., *Program Evaluation and Review Technique: Applications in Education*, Washington, D. C., U. S. Government Printing Office, 1966, 100 pp. ED 003 379, *Office of Education Research Reports, 1956-65*, MF-$0.75; HC-$9.05.

One of the pioneering applications of PERT to education which uses a textbook approach in explaining the relevant concepts. The topics discussed are the management process in educational research and development and the characteristics, applications, and implementation of PERT. A glossary and bibliography are included.

Greene, James H., *Operations Planning and Control*, Homewood, Illinois, Richard D. Irwin, Inc., 1967, 175 pp.

The logic involved for planning and control of production processes is the subject of this book. It is not a book for those who have only a passive interest in a description of planning and control systems but is for those who are actively interested in the design and operation of such systems. While the emphasis is upon industrial production systems, the techniques are equally suitable for planning and control of research operations, instructional processes, facility planning, and program planning.

The techniques of regression analysis, correlation analysis, PERT, linear programming, computer data processing, flow charting, and cost analysis are explained and applied to production processes.

Harty, Larry, and Monroe, Bruce, *A Manager's Guide to Objectives*, Burlingame, California, OPERATION PEP, 1968, 88 pp.

This report is a detailed guide to the derivation and use of objectives in the management process. It is aimed directly at facilitating the operation of PPBS, operations research, and systems analysis techniques. It is written in the programming learning style and can be used independently or as a text for group instruction.

The major topics included in this guide are: 1) a detailed definition of an objective; 2) how to manage the

objective-setting process; 3) how to put objectives into writing; 4) how to analyze objectives; 5) how to refine and clearify objectives; and 6) how to use objectives. An annotated bibliography is included in the report.

Mager, Robert F., *Preparing Instructional Objectives*, Palo Alto, California, Fearon Publishers, 1962, 62 pp.

This entertaining, programmed learning text is written primarily for teachers, but the treatment of objectives is generalizable to other levels and situations.

Differentiation is made between behavior, terminal behavior, criterion, and course description, process objectives and products. Emphasis is placed on defining measureable objectives throughout the book.

Timms, Howard L., *Introduction to Operations Management*. Homewood, Illinois, Richard D. Irwin, Inc., 1967, 159 pp.

This is an introduction to the business decision-making models and processes. Topics covered are the operations function (process of production), management theory, decision theory, systems theory, and decision systems for operations management. Although many quantitative models are discussed, the approach is non quantitative.

The other books in this Irwin series in operations management are:

1. William Morris, *The Capacity Decision System*
2. Louis Gorlin, *The Product-Planning System*
3. Gerald Nadler, *Work Systems Design: The Ideals Concept*
4. Ruddell Reed, Jr., *Plant Location, Layout, and Maintenance*
5. James Greene, *Operations Planning and Control*
6. Robert Fetter, *The Quality Control System*
7. Wilbur B. England, *The Purchasing System*
8. Robert Anthony, and James Hekimien, *Operations Cost Control*

U. S. Department of Health, Education, and Welfare, *Planning-Programming-Budgeting: Guidance for Program and Financial Plan*, Washington, D. C., U. S. Government Printing Office, 1968, 207 pp.

This volume contains the instructions for the preparation of HEW's Program and Financial Plan. The framework for the Program and Financial Plan of HEW is designed as a planning tool and as an information system. It groups resource allocations and program results by major purposes, activities and beneficiary groups. Coding permits information to be sorted also by organization, appropriation, mode of financing, legislative situation, and the nature of the beneficiary to whom the funds may be distributed.

The program structure, budget, activity, organization, legislation, and finance codes are given in addition to the specification of output and target group data. Blank data sheets and general reporting instructions are included in the guide. A glossary of key terms is appended at the end of the volume.

IDENTIFICATION AND ANALYSIS OF INVESTMENT ALTERNATIVES

Part 5

ACTIVITIES, CRITERIA, DISCOUNTING,
EXTERNALITIES, COSTS AND BENEFITS

Abt. Associates, Inc., *Design for Elementary and Secondary Education Cost Effectiveness Model, Volume I: Description, Volume II: Users Guide*, Burlingame, California, OPERATION PEP, 1968, p. 59, 63.

These two volumes depict the conceptual framework, uses, and requirements of the Office of Education cost-effectiveness model developed by Abt. Associates. The model was developed to aid in the evaluation of alternative educational projects within school districts proposed under Title I of the Elementary and Secondary Education Act of 1965. The model had not yet been programmed and put into operation.

The model functions in the following way: using information about the current school system, the historical performances of selected student subpopulations, the social, and academic characteristics of the target population, and the Title I proposed changes in the school environment; the model computes likely short-range changes in students educational achievement and attitude and then extrapolates these effects into longer-range changes in academic achievement, dropout and truancy rates and community effects of changes expected lifetime earnings and equality of educational opportunity.

Baumol, William J., "On the Social Rate of Discount," *American Economic Review*, LVIII, No. 4, September, 1968, pp. 788-802.

This article explores the various components influencing the determination of the interest (discount) rate to be used in evaluating public investments in a manner which is understandable to persons other than professional economists. The major factors considered are taxes, risk, externalities, opportunity cost, and the consumer's subjective time preference.

Baumol begins with a simple descriptive model of public versus private investments which excludes all factors except corporate income taxes assumed to be at a rate of 50 percent. Under the assumptions of this model, he shows that public interest rate should be twice the rate of return on corporate capital. The assumptions of the model are then relaxed to include risk, externalities, and other components.

The major conclusions reached by Baumol are: 1) There is a basic inconsistency between the discount rate required for efficiency in the allocation between private and public investments which is higher than that required to satisfy private subjective time preferences; and 2) there is no need to lower artificially the social rate of discount in order to increase further the prospective wealth of future generations except in the case of irreversible decisions which destroy natural resources.

Cain, Glen G., *Benefit/Cost Estimates for Job Corps*, Madison, Wisconsin, The University of Wisconsin, Institute for Research on Poverty, 1967, 51 pp.

This paper is divided into three sections: Part I gives an overview of the analysis; Part II gives a complete statement of the principle findings and a summary of the methods used in the analysis; Part III is a technical discussion which indicated the source materials used and the procedures employed to manipulate the data.

The sole measure of benefits was the change in earnings of the corpsmen due to the educational program, all other potential benefits are ignored in the analysis. One of the two measures of earnings improvement is based on the educational gains achieved in Job Corps in conjunction with the relation between education and lifetime earnings that have been estimated in the best statistical studies available. The present value of the improvement in lifetime earnings found by this method ranged from $3,600 to $5,900. The second procedure is based on a direct comparison of wages currently earned by ex-Corpsmen with the wages of a comparable group who had no Job Corp experience and fielded a change in present value of $5,100. The net costs of a five-month training program was $3,500 per Corpsman and included overhead expense, earnings foregone, and operating costs minus the value of transfer payments. Improvements in earnings were discounted at three and five percent while a five percent interest rate was used for capital costs.

Carroll, Adger, B., and Ihnen, L. A. *Costs and Returns for Investments in Technical Schooling by a Group of North Carolina High School Graduates*, Raleigh, North Carolina, North Carolina State University, 1967, 49 pp. ED 025 586, RIE, May 1969, MF-$0.25; HC-$2.60.

This study estimated the incremental benefits and costs of two years of post-secondary, technical schooling for 45 white, male graduates. Estimated costs included both direct and the opportunity costs of foregone earnings. Benefits were computed by comparing the income received by the technical school graduates to income earned by a group of high school classmates with similar academic records whose high school graduation marked the termination of their educational progress. Multiple regression analysis was used to adjust for remaining difference between high school and technical school graduates with respect to environment, academic performance, civilian and military experience and migration.

The estimated lifetime public rate of return to the educational investment varied from 16.7 to 20.1 percent. Lifetime private rates of return ranged from 23.9 to 25.9 percent. The authors emphasize that these rates of return are not generalizable to other time periods, locations or to specific individuals and stress the need for a continuing follow-up program for high school and post-secondary graduates.

Conley, Ronald W., *The Economics of Vocational Rehabilitation*, Baltimore, Maryland, The Johns Hopkins Press, 1965, 177 pp.

A comprehensive description of the extent, characteristics and social costs of disability is presented in the first portion of the book. Also the vocational rehabilitation programs are discussed with respect to their history, process and purposes.

In the economic analysis, a thorough explication of the assumptions and problems of identifying and estimating the monetary costs and benefits of rehabilitation programs is made. Conley concludes that rehabilitation programs can be justified solely on the basis of net monetary benefit. For example, the estimated total annual wages of rehabilitation increased by $120.9 millions in 1958 while the total costs of program were $67.5 millions.

The specific factors influencing the success of rehabilitation programs and the question of increasing the number of programs are discussed in the last portion of the book.

Dorfman, Robert, ed., *Measuring Benefits of Government Investments*, The Brookings Institution, Washington, D. C., 1965, 429 pp.

The papers and discussions in this volume were presented in a conference held at the Brookings Institution in November 1963 to explore the problems of appraising the benefits that are likely to accrue from proposed public investment projects.

The seven cost-benefit studies included in this book deal with the following topics: 1) research and development projects; 2) outdoor recreation facilities; 3) educational program of dropouts; 4) federal aviation expenditures; 5) highway programs; 6) urban renewal projects; and 7) public health programs. Each paper is accompanied by comments from one to three discussants and the editor's concluding statement. A wide range of approaches to cost-benefit analysis are explored in these papers. Many of the discussants were very skeptical and inclined to doubt whether the most important social effects of government investments could even be appraised quantitatively by cost-benefit analysis or any other formalized method.

Goldman, Thomas A., ed., *Cost-Effectiveness Analysis: New Approaches in Decision-Making*, Frederick A. Praeger, Publishers, New York, New York, 1967, 231 pp.

The papers collected in this book include a broader spectrum of techniques than cost-effectiveness analysis. This group of decision-aiding techniques, known as systems analysis, cost-benefit, and operations research, are concerned with the analysis of choice and have the same basic elements: 1) an objective or objective function; 2) alternative means; 3) costs of the various alterratives; 4) a model or abstraction of the real situation; and 5) a criterion or standard to rank alternatives.

Six of the thirteen papers are aimed directly at defense problems and most of the contributors are personnel from the defense department or the RAND Corporation. Four of the papers are methodological presentations and the remaining three are cost-effectiveness studies of domestic programs, 10 were on poverty, and an analysis of metropolitan transportation systems.

Kaufman, Jacob J.; Stromsdorfer, Ernest W.; Hu, Teh-wei; and Lee, Mawlin, *An Analysis of the Comparative Costs and Benefits of Vocational Versus Academic Education in Secondary Schools*,

Preliminary Report, University Park, Pennsylvania, Institute for Research on Human Resources, 1967, 177 pp.

The first portion of this report is devoted to a theoretical discussion of public expenditures, cost-effectiveness analysis and data needs. The concepts and their limitations are presented clearly and in depth.

An empirical analysis of benefits and costs is presented in the second portion. Twenty schools, three different types, five curricula, and in two different cities, were included in the study. One and six year follow-ups of graduates obtained both employment records and gross monthly earnings. Although the level of explanation by the empirical analysis of benefits was quite low, the authors conclude that vocational-technical education when compared with other curricula has a payoff in terms of earnings and employment.

Quiren, G. David, *The Capital Expenditure Decision*, Homewood, Illinois, Richard D. Irwin, Inc., 1967, 258 pp.

This volume provides a systematic treatment of the theory of capital expenditures management for students and administrators. The major emphasis is placed upon criteria for project selection and on the measurement of benefits and costs.

Specific topics include discounting, risk and uncertainty, capital rationing, decision processes, evaluation of several decision criteria such as benefit/cost ratios and internal rates of returns and the unique problems of measuring benefits and costs in the public sector.

This text is not aimed at educational problems, but does provide a comprehensive review of the basic theory and models for benefit/cost analysis in any area in an understandable fashion.

Somers, Gerald G., ed., *Retraining the Unemployed*, Madison, Wisconsin, The University of Wisconsin Press, 1968, 351 pp.

The studies described in this volume are among the first to evaluate the recent retraining programs for unemployed workers established under federal, state, municipal and union-management auspices. The eight empirical studies included in this book report on five types of training programs in eight states.

The West Virginia surveys, Gibbard and Somers, Cain and Stromsdorfer, include trainees in federal Area Redevelopment Act (ARA) programs and in courses established under state legislation. In Connecticut, Borus, trainees in ARA and state-supported courses were studied in four locations. The Massachusetts study, Chesler, included only ARA trainees. ARA courses in Tennessee were studied and reported in chapters by Williams and Solie. The Michigan study, Ferman and Harvey, encompasses five training programs, three by private agencies, one under ARA and one MDTA program. Weber investigated five retraining projects in Nebraska, Texas, and Illinois which included two union-management programs, two ARA programs and one under the Rehabilitation Service.

Warmbrod, J. Robert, *Review and Synthesis of Research on the Economics of Vocational-Technical Education*, Columbus, Ohio, The Center for Vocational and Technical Education, 1968, 53 pp. Ed 023 937, RIE, March 1969, MF-$0.50; HC-$3.20.

This review of recent publications consists of sections on the economics of education, benefit-cost analysis, and summaries of economic studies dealing with vocational education and manpower training programs. A 13 page bibliography is also included.

Reports of research by Jacob J. Kaufman, A. J. Corazzini, A. B. Carroll and L. A. Ihnen, M. K. Taussig, G. L. Mangum, and G. G. Somers are among those summarized by the author.

EDUCATION AND ECONOMICS

part 6

HUMAN RESOURCES, RESOURCE ALLOCATION, AND THE MARKET SYSTEM

Becker, Gary S., Human Capital: *A Theoretical and Empirical Analysis With Special Reference to Education*, New York, New York, Columbia University Press, 1964, 187 pp.

A pioneering work on the production of and return to human capital. Part One, theoretical analysis, contains one chapter on the effects of various types of investment in human capital and a second chapter on the relative rates of return with respect to time, risk, ability, etc.

The second part of the book is devoted to an empirical analysis of the rates of return from high school and college education. Factors examined include ability, race, sex, social versus private returns, and wealth.

Benson, Charles S., *The School and the Economic System*, Chicago, Illinois, Science Research Associates, Inc., 1966, 117 pp.

A general description of the relationship of education to the economic system. The economic rationale is presented for consumer and producer decision-making, and the role of government. Contemporary issues in education such as the economic benefits and costs, quantitative measurement, and manpower planning are discussed briefly.

Blaug, M., ed., *Economics of Education I: Selected Readings*, Baltimore, Maryland, Penguin Books Ltd., 1968, 442 pp.

A book of 19 articles written from 1961 to 1967 which is representative of the totality of recent work on the economics of education.

The articles are classified into five topics: 1) The concept of human capital; 2) surveys of the literature; 3) cost-benefit analysis of educational expenditures; 4) the manpower-forecasting approach; and 5) educational planning in developing countries.

The contributors include T. W. Schultz, H. G. Johnson, H. G. Shaffer, W. G. Bowen, M. J. Bowman, W. Lee Hanson, B. A. Weisbrod, G. S. Becker, R. S. Eckaus, M. Blaug, H. S Parnes, C. A. Moser, P. R. G. Layard, K. J. Arrow, W. M. Capron, R. G. Hollister, C. A. Anderson, T. Balogh, P. P. Streeten, and P. J. Foster. A bibliography, author and subject index are also included.

Ferguson, C. E., *Microeconomic Theory*, Homewood, Illinois, Richard D. Irwin, Inc., 1966, 439 pp.

This is an intermediate level college textbook on microeconomics. It contains five major parts. Part one, the theory of consumer behavior and demand, covers the development of individual indifference curves to the characteristics of market demand curves. Part two, theory of production and cost, contains explanations of fixed and variable inputs, marginal and average products and costs, and rules for maximizing profit or minimizing cost. Part three, theory of the firm and market organization, explains the theory of pricing under conditions of perfect competition, pure monopoly, monopolistic competition and oligopoly. Part four, theory of distribution, includes the theory of price, wages, and employment under conditions of perfect and imperfect markets. Part five, theory of general equilibrium and economic welfare, contains some specific discussion of social benefits and costs arising from the existence of external economies or diseconomies.

Mushkin, Selma J., ed., *Economics of Higher Education*, Washington, D. C., U. S. Government Printing Office, 1962, 406 pp.

The four major topics covered are: 1) the supply and demand of college-trained personnel; 2) higher education as an investment in people; 3) financial resources; and 4) economic research in education. Contributors include many of the pioneers in the economics of education such as T. W. Schultz, Alice Rivlin, Mary Jean Bowman, and S. J. Wolfbein.

Part one consists of five chapters which are directed at the estimation of future enrollments and the projection of the need for graduates. Specific examples of health specialists, scientists and engineers are investigated. The concepts of human capital and estimates of the United States stock are presented in the second part. The economic value of education is explored from both societies and an individual's viewpoint. The financing of higher education is analyzed with respect to private, state and federal roles in part three. Student loans, tax systems, tuition fees,

and the special problem of financing research are among the topics discussed. In the final section, the need for research in education is emphasized. A large number of questions are raised concerning the structure, inputs, outputs, and financing of education, and the role of the economist in educational research.

Samuelson, Paul A., *Economics: An Introductory Analysis*, Seventh Edition, New York, New York, McGraw-Hill Book Company, 1967, 821 pp.

This is a basic introduction to economics. It is written for a year course at college freshman level. There are six major sections: 1) basic economic concepts and national income; 2) determination of national income and its fluctuations; 3) the composition and pricing of national output; 4) distribution of income and the pricing of the productive factors; 5) international trade and finance; and 6) current economic problems.

Specific chapters which may be of special interest include the following: 1) affluence and poverty, chapter six; 2) the economic role of government, chapter eight; 3) analysis of costs, chapter 24; 4) theory of production and marginal products, chapter 27; 5) competitive wages and collective bargaining, chapter 29; 6) interest and capital, chapter 30; and 7) problems of growth and price stability in an advanced economy, chapter 39. Each chapter has a summary, and discussion questions.

Schultz, Theodore W., *The Economic Value of Education*, New York, New York, Columbia University Press, 1963, 92 pp.

This book is an overview of the economic aspects of education with emphasis on describing and quantifying the various components of costs and benefits. Related topics such as the public finance of education, manpower planning, and the internal efficiency and organization of schools are not discussed.

The costs of education delineated by Schultz are: 1) direct operating expenses, capital outlays and auxiliary items; and 2) indirect costs borne by the student and family such as tuition, books, and foregone earnings of the student. Also discussed is the tendency of educational costs to increase at a faster rate than either population or gross national product.

The economic value of education is divided into three parts: 1) present consumption; 2) future consumption (an investment); and 3) future producer capability (an investment). Within this section, other related topics such as the role of education in economic growth, human capital formation, rates of return, and the economic functions of educational establishments are explicated by Schultz.

"Symposium on the Economics of Education," *American Economic Review*, Volume LVI, May, 1966, pp. 358-400.

This symposium was a part of the 1965 annual meeting of the American Economics Association. It consisted of three papers by Gary S. Becker and Barry R. Chiswick, Eugene Smolensky, and Finis Welch with discussion by Lee R. Martin, Alice M. Rivlin and Andre Daniere.

The paper by Becker and Chiswick develops a theory linking investment in human capital and the distribution of earnings. The implications of the theory are empirically tested. Smolensky's paper, "Investment in the Education of the Poor: A Pessimistic Report," discusses poverty, externalities and the present "irrationality" of the poor. Welch attempts to measure the quality of schooling through expenditures per pupil, staff per pupil, salary per staff member and average number of pupils per secondary school.

DATA AND STATISTICAL ANALYSIS

Part 7

STUDENT AND COMMUNITY DATA, MODELS, PROCEDURES, AND COMPUTORS

Bauer, Raymond A., ed., *Social Indicators*, Cambridge, Massachusetts, The M. I. T. Press, 1966, 357 pp.

The five chapters of this volume assess the present state of social statistics and explore the requirements of an improved informational system. In chapter one, Bauer presents an overview of the problem and summarizes the other four chapters.

Albert Biderman compares the existing social indicators to the national goals and establishes the problem in chapter two. Bertram Gross, chapter three, set forth a broad outline of an ideal system of social statistics. In chapter four, Biderman discusses the need for stand-by research facilities to collect data on events falling outside the regular statistical series. In the final chapter, Rosenthal and Weiss propose a feedback system for government agencies and the implications of such a system.

Some consideration is given throughout the book to both the positive and negative consequences of a system of social indicators upon national planning, social welfare, individual values and representation of interest groups.

Bross, Irwin D. J., *Design for Decision: An Introduction to Statistical Decision-Making*, New York, New York: The Free Press, 1965, 276 pp.

The basic concepts of probability and statistical decision-making techniques are introduced at an elementary level in this book. Concepts are primarily explicated by means of verbal description, therefore only a rudimentary knowledge of algebra is required to understand the subject matter.

The first five chapters contain the history and nature of methods of decision-making. The basic techniques of

statistical probability and prediction are outlined and there is a discussion of the problem of quantifying individual and social values.

Statistical decision models and rules based on probability analysis are contained in chapters six, seven, and eight. The concepts of opportunity cost, payoff, expected value and sequential decision models are described.

The topics of measurement, sampling, data, and models are explained in the context of statistical decisions in the following four chapters. Other techniques, statistical inference, and the future role of statistical decision-making methods are discussed by the author in the last three chapters.

Draper, N. R., and Smith, H., *Applied Regression Analysis*, New York, New York, John Wiley and Sons, Inc., 1966, 407 pp.

This textbook covers one of the major statistical techniques used in explanation and prediction of relationships between variables in non-experimental situations. The rigor of the text moves from a simple two-variable linear regression analysis to multiple non-linear regression models. Emphasis is placed on actual applications, examination of risiduals, and selection of the "best" explanatory regression equation. Specific treatment is made of multiple regression analysis applied to analysis of variance problems including both one and two-way classifications.

Ferguson, George A., *Statistical Analysis in Psychology and Education*, New York, New York, McGraw-Hill Book Company, 1966, 446 pp.

The object of this book is to introduce students and research workers to the concepts and applications of statistics. Emphasis is placed on the analysis and interpretation of data resulting from the conduct of experiments. Topics included in this textbook include sampling, various tests of significance, correlation methods, analysis of variance, statistical transformation, and selected non-parametric tests.

Freund, John E., *Modern Elementary Statistics*, Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1967, 432 pp.

The objectives of this textbook is to acquaint beginning students in the biological, social, and physical sciences

with the fundamentals of modern statistics. There are three major parts, descriptive methods, basic theory, and statistical inferences. Part one discusses frequency distributions, and measures of location and variation. The emphasis in the second part is on probability, statistical decision problems, and sampling. Statistical inference, part three, includes chapters on testing means and variances, analysis of variance, non-parametric tests, linear regression and correlation analysis.

March, G. B., *Occupational Data Requirements for Educational Planning: Proceedings of a Conference*, Madison, Wisconsin, The University of Wisconsin, Center for Studies in Vocational and Technical Education, 1966, 165 pp. ED 003 491. *Office of Education Research Reports, 1956-65.* MF-$0.75; HC-$9.00.

This conference report consists of papers and discussion on four topics: 1) occupational data requirements for educational planning; 2) role of technological forecasting in the development and use of manpower; 3) foreign experience in the utilization of occupational data for educational planning; and 4) evaluation of occupational data and their use in occupational planning.

Five formal papers were presented and discussed by 25 leading educators and economists. Most of the major problems and benefits of educational planning are mentioned by the participants, but no easy solutions are developed.

Thiel, Henri; Boot, John C. G.; and Kloek, Teun, *Operations Research and Quantitative Economics: An Elementary Introduction*, New York, New York, McGraw-Hill Company, 1965, 258 pp.

Many of the new mathematical and statistical techniques are presented in a relatively simple fashion. But in order to understand the concepts, a good knowledge of algebra, traditional statistics and freshman economics is necessary.

The basic concepts of linear programming, input-output analysis, game theory, probability, econometric macro models and management games are included in the volume.

U. S. Department of Health, Education, and Welfare, *Standard Terminology for Instruction in Local and State School Systems: An Analysis of Instructional Content, Resources, and Processes* (Third Draft), Handbook VI, Washington, D. C., U. S. Office of Education, State Educational Records and Reports Series, 1967, 690 pp.

This handbook is a guide for items of formation used in keeping records and making reports about curriculum and instruction. It classifies and defines specific items of information about the organization, administration, content, resources, and processes of instruction and includes related terminology. All items are assigned code number and are defined in detail in chapters two through five.

The introduction of the handbook outlines its purpose, some basic definitions and methods to adapt this handbook to local records and reports systems. The sixth chapter discusses the need for information, procedures for implementing an informational system, and the use of curriculum and instruction data in research, and experimentation. A comprehensive glossary comprises the final chapter.

LIMITATIONS OF PPBS

Part 8

50151

CONCEPTUAL, POLITICAL, ORGANIZATIONAL AND TECHNICAL ASPECTS

Callahan, Raymond E., *Education and The Cult of Efficiency*, Chicago, Illinois, The University of Chicago Press, 1962, 273 pp.

This is a study of the historical development of the United States school systems from "centers of learning" to "educational factories" during the period from 1900 to 1962. The author is very critical of the emphasis on quantitative business concepts such as efficiency, time-space studies and cost accounting by educational administrators, school boards, and the general public. Also, the change in emphasis from "intellectual-academic" education to "practical" education is not viewed as a desirable occurance. This book provides a counterpoise for those who view education as a business.

Hartley, Harry J., "Twelve Hurdles to Clear Before You Take on Systems Analysis," *The American School Board Journal*, Volume 156, No. 1, July, 1968, pp. 16-18.

A very brief, but concise article which clarifies the dangers of attempting systems analysis. The hurdles include personnel, politics, costs, goals, measurement, testing, efficiency, centralization, organizations, teachers, transfer, and Wisdom lag.

"Planning-Programming-Budgeting System Reexamined: Development, Analysis, and Criticism, A Symposium," *Public Administration Review*, Volume XXIX, No. 2, March/April, 1969, 95 pp.

The emphasis on this second PAR symposium is on politics, implementation, state and city applications, and limitations of PPBS. The contributors and articles are:

1. Bertram M. Gross, "The New Systems Budgeting."

2. Allen Schick, "Systems Politics and Systems Budgeting."

3. Yehezkel Dror, "PPB and the Public Policy-Making System."

4. William M. Capron, "PPB and State Budgeting."

5. Frederick C. Mosher, "Limitations and Problems of PPBS in the States."

6. Selma J. Mushkin, "PPB in Cities."

7. C. W. Churchman and A. H. Schainblatt, "PPB: How Can It Be Implemented?"

8. Aaron Wildavsky, "Rescuing Policy Analysis from PPBS."

This volume also contains book reviews on systems theory (three books) by Fremont J. Lyden, on public participation, innovating and school bureaucracies (two books) by Bruce K. Eckland, and on computors in public administration (five books) by E. S. Savas.

U. S. Subcommittee on Economy in Government, *The Planning-Programming-Budgeting System: Progress and Potentials, Hearings*, Washington, D. C., Joint Economic Committee of the Congress, 1967, 411 pp.

The purpose of the hearings was to evaluate PPBS with respect to six questions: 1) What progress have the executive agencies made in applying PPBS? 2) How have state and local governments used PPBS? 3) How can interest/discount rates be utilized in PPBS to aid decision-making? 4) Can PPBS be helpful to the Congress? 5) What alternatives does the Congress have for developing staff capability in PPBS techniques of analysis? 6) How effective is PPBS in identifying national goals?

The witnesses included representatives from executive agencies, representatives from state and local government and personnel from universities and private research firms. Also the document contains PPB Notes one, five, six and seven of the State-Local Finances Project and reprints of articles on the budgeting process from the Graduate School of Administration, Carnegie Institute of Technology.

Wildavsky, Aaron, *The Politics of the Budgetary Process*, Boston, Massachusetts, Little, Brown and Company, 1964, 216 pp.

This book provides a combination of budgeting and political theory and an empirical examination of the actual political process of formulating the federal budget. Emphasis is placed on the differences between theories espoused and actual practices.

Although PPBS was in its infancy when the book was written, the basic concepts of PPBS are mentioned and he presents a political rationale as to why PPBS would probably not cause any major changes in resource allocation patterns due to the political benefits and costs conflicting with economic analysis.

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